North Central College Fall Term 2000 PHY 111

Professor Lincoln (630) 840-5218 LUCIFER@FNAL.GOV (most effective)

Course Description: Topics include motion in one and two dimensions, work and energy, momentum and circular motion. There is a laboratory component.

Required Text: *College Physics*, 5th edition, by Serway and Faughn and North Central College Physics Department Laboratory Manual.

Homework: Homework is a large portion of your grade. Each assignment missed will reduce your final grade by approximately three percentage points. You will be given a list of assignments that you are expected to be able to do. These problems will be collected for grading according to the attached schedule and are due at the beginning of class. You are encouraged to work together if necessary, but you must be certain that you are able to do the work on your own. Problems that are similar to those given in the homework will be used for part of the exams. Homework solutions will be posted in the physics department. While in general it is the student's responsibility to get the solutions and understand them, I will go over selected problems in class if requested. This will occur at the beginning of each class.

Homework can be done on any kind of paper (8.5" x 11"). If you use spiral notebook paper, you must trim the left-hand side of the paper. (No frizzies!) Write only on one side of the paper, and staple them in the upper left-hand corner. The problems should be turned in in order. If you do not work the problems in order, you should leave enough space for the ones you are skipping, or simply insert extra pages. The work should be done as neatly as you can. I will not assume that you are brilliant simply because I can't read your writing.

Late Homework Policy: Late homework is, in general, not accepted. However, each student is allowed to turn in *one* assignment late. It must be turned in no later than the beginning of the class following the class on which the assignment is due. ***NO*** credit will be given for late homework beyond this one. I recommend that you use this 'freebie' for a time in the quarter when you have multiple tests or for similar circumstances.

Attendance Policy: Students attendance is a very strong predictor of one's understanding of the subject and, ultimately, one's final grade. Consequently, students are expected to attend each class. Students with more than three absences may be dropped from the class. Students are expected to attend all laboratory sessions. Your final grade will drop by two percentage points for each laboratory session that you miss, even if you turn in a lab report.

Examination Policy: There will be four exams given during the class, one approximately every two weeks. These exams will be weighted equally and should take about one hour each. The lowest exam grade will be dropped when calculating your final grade. Under no circumstances will make-up exams be given. If you miss an exam, this grade is the one that will be dropped. There will be a comprehensive final exam. Chapter 8 will be tested only on the final.

Laboratory: Each week a lab will be done. The lab time will generally be scheduled to occur during the Wednesday class. There will be some time on the Monday class to finish data acquisition and to polish your write-up. Labs are due before you leave on the Monday following the data acquisition period and will be returned on the following Wednesday. Student participation in the data-taking activities will be noted and will also be reflected in the lab-writeup grade.

Grading: Grades follow the normal scale (90/A, 80/B, 70/C, 60/D). The weights of the various components of your grade are: Homework 30%, Exams 30%, Final 25%, Labs 15%.

Office Hours: As an adjunct professor, I am rarely on campus. I will usually be on campus for about one hour before class, although this is not universal and will be somewhat unpredictable. I can be contacted both by phone and email. You may talk to me to schedule some time before or after class. In addition, Dr. Liaw can be contacted for assistance throughout the day. Contact her for availability.

Drop/Add Policy: In the unfortunate situation of poor class performance, it is the responsibility of the student to drop the class by the deadline. It is the student's responsibility to find out when these deadlines are. I will **NOT** drop a student late in the quarter in order to rescue your GPA.

Class Schedule

Week	Topic	Homework Problems
1 Sep 11 Sep 13	Class introduction, units, dimensional analysis, unit conversion, coordinate systems, trigonometry, properties of vectors and scalars Lab: Laboratory Procedures and Graphing	Chapter 1 1,3,5,6,8-10 Q 3,4 P 4,14,18,22,26 Chapter 3 1-3 P 2,4,8, 12 (Due Sep 18)
2 Sep 18 Sep 20	Motion in one dimension, displacement, average velocity, instantaneous velocity, acceleration, motion diagrams, freely falling objects Lab: Components of Forces	Chapter 2 1-7 Q 2,6,14 P 2,5,10,18,20,26,36,38,40 (Due Sep 27)
3 Sep 25 Sep 27	Velocity and acceleration in two dimensions, projectile motion, relative velocity Exam 1 [Ch 1, 2, 3 (1-3)] (Sep 25) Lab: Projectile Motion	Chapter 3 4-6 Q 10,11,14 P 16,20,22,24,26,36,40,44 (Due Oct 2)
4 Oct 2 Oct 4	Concept of force, Newton's three laws Lab: Newton's Second Law	Chapter 4 1-**5** Q 2,10,16 P 2,4,6,10,12,16,20,26,58 (Due Oct 11)
5 Oct 9 Oct 11	Friction, work, kinetic energy and the work-kinetic energy theorem Exam 2 [Ch 3 4-6, 4 (1-**5**)] (Oct 9) Lab: Friction (A) Motion Sensor (B) Momentum (C)	Chapter 4 **5** Q 15 P 30,32,38 Chapter 5 1,2 Q 3,6,8 P 2,6,8,12,16 (Due Oct 16)
6 Oct 16 Oct 18	Potential energy, conservative and nonconservative forces, conservation of mechanical energy, nonconservative forces and the work-kinetic energy theorem, conservation of energy in general, power Lab: Friction (C) Motion Sensor (A) Momentum (B)	Chapter 5 3-8 Q 14,15,16 P 18,20,24,26,32,34,42,47 (Due Oct 23)
7 Oct 23 Oct 25	Momentum and impulse, conservation of momentum, collisions, glancing collisions Exam 3 [Ch 4 (**5**), 5] Lab: Friction (B) Motion Sensor (C) Momentum (A)	Chapter 6 1-4 Q 2,6,14,15 P 4,14,18,22,28,30,36 (Due Nov 1)

8 Oct 30 Nov 1	Angular speed and angular acceleration, rotational motion under constant angular acceleration, relations between angular and linear quantities, centripetal acceleration, forces causing centripetal acceleration, describing motion of a rotating system Lab: Rotation #1	Chapter 7 1-6 Q 2,3,4 P 2,4,8,10,12,18,22,26,52 (Due Nov 6)
9 Nov 6 Nov 8	Torque, torque and the second condition for equilibrium, center of gravity, objects in equilibrium, relationship between torque and angular acceleration, rotational kinetic energy, angular momentum Exam 4 [Ch 6, 7] (Nov 6) Lab: Rotation #2	Chapter 8 1-7 Q 4,8,12 P 2,4,8,13,18,26,36,40,44, 48 (Due Nov 13)
10 Nov 13 Nov 15	Review for Final	
11 Nov 20	**Final Exam** (probably during normal class hours, TBD) [Ch 1-8]	